

(99 mmol) of bromoundecanol, dissolved in 200 ml of ethanol/H₂O (3/1), were added dropwise to the boiling reaction mixture over a period of 20 minutes with vigorous stirring. The mixture was then heated under reflux for two days, resulting in a thick brown precipitate. The precipitate was isolated by means of an ultracentrifuge and recrystallised from CHCl₃/ethanol (1/2.5). 12.0 g (57% of the theoretical yield) of colourless silvery flake-like crystals were obtained.

Identification:

1. Elemental analysis:

Found: C 77.42%; H 10.29%; O 12.29%:

Calculated: C 77.52%; H 10.33%; O 12.15%.

2. IR and NMR spectrum.

EXAMPLE 7

Preparation of compound (7)

2.0 g (3.8 mmol) of (6) were suspended in freshly distilled DMF under a nitrogen atmosphere. 7.8 g (37.8 mmol) of dicyclohexylcarbodiimide in 5 ml of DMF were added. 0.8 g (8.4 mmol) of sulphuric acid in 2 ml of DMF were then slowly added dropwise to the reaction mixture; during this time, the temperature was kept below 25° C. by ice cooling. The mixture was stirred at room temperature under a nitrogen atmosphere and with the exclusion of light for 2 days, resulting in a white precipitate. After the reaction was complete, 0.7 ml of H₂O was added to the mixture with ice bath cooling and vigorous stirring. The precipitate was then separated off by filtration. The filtrate containing the product was then brought to a pH of 8.5 with 10% strength KOH solution. The solvent was distilled off, and the residue was chromatographed through 500 ml of silica gel using warm DMF as the eluent. This gave 1.2 g (45% of the theoretical yield) of a white powder-like substance.

Identification: NMR spectrum.

EXAMPLE 8

Silanation of the support

The support used was quartz glass or silicon wafer. The wafer was treated with H₂O in an ultrasound bath for 1 minute and carefully dried with N₂ gas, which cleaned the surfaces and made them dust-free. The wafer was then placed in Caro's acid (conc. H₂SO₄/H₂O₂ = 7/3) to purify and treated therein at 80° C. in an ultrasound bath for 1 hour. After cooling to room temperature, the wafer was treated three times in H₂O in an ultrasound bath for 60 seconds each time and washed free of acid with H₂O. The wafer was then placed into H₂O/H₂O₂/NH₃ (5:1:1) solution and treated therein at 80° C. for 5 minutes. The wafer was then placed in H₂O and carefully washed free of salt. Finally, the wafer was treated before the silanation reaction in methanol, methanol/toluene and toluene for 2 minutes each time to remove traces of water. The wafer thus obtained was placed in 5% strength 3-aminopropyl-dimethylethoxysilane solution in toluene under an N₂ atmosphere. The silanation reaction was carried out under an N₂ atmosphere for 15 hours. After the reaction was complete, the wafer was first treated twice with toluene under an N₂ atmosphere for 30 minutes each. Finally, the wafer was treated with toluene, toluene/-dimethyl sulphoxide (DMSO) and DMSO in an ultrasound bath for 1 minute each time. This gave a homogeneous hydrophobic surface.

EXAMPLE 9

Preparation of a support having a monomolecular interlayer according to FIG. 1B

The quartz glass or Si wafer was treated according to

Example 8. This wafer which then contained ionisable amino groups on the surface was treated with a solution of 4 to 5 mg of (5), 0.3 ml of 0.1 N HCl, 1.7 ml of H₂O and 8 ml of DMSO at 0° C. for 20 minutes, during which the negatively charged anions (5) in the solution were adsorbed at the positively charged surface of the wafer with salt formation of the type of ammonium sulphate. The wafer was then first treated in ice-cold H₂O and twice in H₂O at room temperature for 20 seconds each time. This wafer having a monomolecular interlayer was made available to the further preparation of multilayer systems.

EXAMPLE 10

Preparation of a support having a polymer interlayer according to FIG. 2

To this end, the quartz glass or Si wafer was treated according to Example 8. This wafer which then contained ionisable amino groups on the surface was treated with a solution of 20 mg of polystyrene polysulphonic acid sodium salt (9), 0.3 ml of 0.1 N HCl and 9.7 ml of H₂O at room temperature for 20 minutes, during which the negatively charged anions (9) in the solution were adsorbed at the positively charged surface of the wafer with salt formation on the type of ammonium sulphate. This wafer having a polymer interlayer was made available to the further preparation of multilayer systems.

EXAMPLE 11

Preparation of a physisorbed monomolecular multilayer on the monomolecular and polymer interlayer according to FIG. 3 and FIG. 6

The supports prepared according to Example 9 and Example 10, i.e. the support having the monomolecular or polymer interlayer, were used.

The wafer was treated with a solution of 10 mg of (7) in 10 ml of H₂O at room temperature for 20 minutes. This was followed by three rinsing operations in H₂O at room temperature for 20 seconds each time. This wafer was then treated with a solution of 4 to 5 mg of (5), 2 ml of H₂O and 8 ml of DMSO at room temperature for 20 minutes. The wafer was then first treated in ice-cold H₂O and twice in H₂O at room temperature for 20 seconds each time. The multilayer was constructed by repeating these adsorption processes alternately with (5) or with (7).

EXAMPLE 12

Preparation of a physisorbed polymer multilayer on the monomolecular and polymer interlayer according to FIG. 4 and FIG. 7

The support was prepurified and silanised, as described in detail in Example 8. The supports were then treated to give the stable charged surface according to Example 9 and Example 10. The wafer was first placed in a solution of 30 mg of the polymer ammonium salt (8) described above and 10 ml of H₂O and treated therein at room temperature for 20 minutes. The wafer was then washed in 10 ml of H₂O at room temperature three times for 20 seconds each time.